```
% Problem 4
f = @(x) cos(x)/cosh(x);

subplot_num = 1;
grid on;

a = 1;
n = 3;
[points, coefficients] = find_coefficients(a, n);
% note that find_coefficients is defined in a separate file
subplot(2, 4, subplot_num);
subplot_num = subplot_num + 1;
fplot(f, [-a a], '-b'); hold on; plot(points(:, 1), points(:,
 2), 'xr');
xs = linspace(-a, a, 30);
plot(xs, polyval(coefficients, xs)); hold off;
title(strcat(strcat('Problem 4, a=', int2str(a)), strcat(', n=',
 int2str(n))));
legend('f(x)', 'data points', 'interpolating polynomial');

a = 1;
n = 5;
[points, coefficients] = find_coefficients(a, n);
subplot(2, 4, subplot_num);
subplot_num = subplot_num + 1;
fplot(f, [-a a], '-b'); hold on; plot(points(:, 1), points(:,
 2), 'xr');
xs = linspace(-a, a, 30);
plot(xs, polyval(coefficients, xs)); hold off;
title(strcat(strcat('Problem 4, a=', int2str(a)), strcat(', n=',
 int2str(n))));
legend('f(x)', 'data points', 'interpolating polynomial');

a = 1;
n = 10;
[points, coefficients] = find_coefficients(a, n);
subplot(2, 4, subplot_num);
subplot_num = subplot_num + 1;
fplot(f, [-a a], '-b'); hold on; plot(points(:, 1), points(:,
 2), 'xr');
xs = linspace(-a, a, 30);
plot(xs, polyval(coefficients, xs)); hold off;
title(strcat(strcat('Problem 4, a=', int2str(a)), strcat(', n=',
 int2str(n))));
legend('f(x)', 'data points', 'interpolating polynomial');

a = 1;
n = 15;
[points, coefficients] = find_coefficients(a, n);
subplot(2, 4, subplot_num);
subplot_num = subplot_num + 1;
```

```
fplot(f, [-a a], '-b'); hold on; plot(points(:, 1), points(:,
 2), 'xr');
xs = linspace(-a, a, 30);
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 int2str(n))));
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a = 5;
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[points, coefficients] = find_coefficients(a, n);
subplot(2, 4, subplot_num);
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legend('f(x)', 'data points', 'interpolating polynomial');

a = 5;
n = 5;
[points, coefficients] = find_coefficients(a, n);
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subplot_num = subplot_num + 1;
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 2), 'xr');
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title(strcat(strcat('Problem 4, a=', int2str(a)), strcat(', n=',
 int2str(n))));
legend('f(x)', 'data points', 'interpolating polynomial');
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```
Warning: Function fails on array inputs. Use element-wise operators to
 increase
speed.
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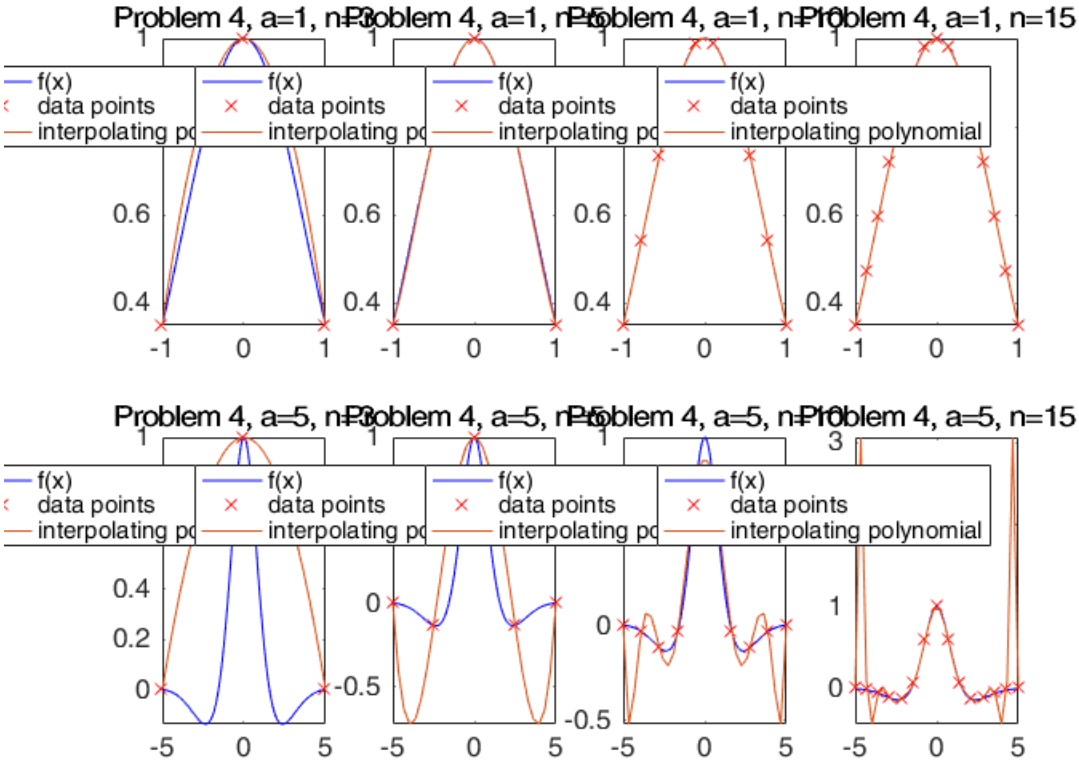
speed.
Warning: Polynomial is badly conditioned. Add points with distinct X
 values,
reduce the degree of the polynomial, or try centering and scaling as
 described
in HELP POLYFIT.
Warning: Function fails on array inputs. Use element-wise operators to
 increase
speed.
```

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